**IN THE CLAIMS:**

Please cancel claim7 and amend claims 1, 5, 6 and 18 as follows:

1. (amended) An optical waveguide comprising:

a polymer substrate having a first coefficient of thermal expansion;

a lower cladding disposed on the substrate, the lower cladding being a first perhalogenated polymer and having a second coefficient of thermal expansion differing from the first coefficient of thermal expansion by less than approximately 40%; and

a polymer core disposed on at least a portion of the lower cladding.

2. (original) The optical waveguide according to claim 1, wherein the core is a second perhalogenated polymer.

3. (original) The optical waveguide according to claim 2, wherein at least one of the lower cladding and the core is a perhalogenated polymer.

4. (original) The optical waveguide according to claim 1, further comprising an upper cladding disposed on the core and a remaining portion of the lower cladding.

5. (amended) The optical waveguide according to claim 1, wherein the ~~polymer substrate has a~~ first coefficient of thermal expansion ~~being~~ is between 50 and 300 parts per million per degree Celsius.

6. (original) The optical waveguide according to claim 5, wherein the ~~lower cladding has a~~ second coefficient of thermal expansion ~~being~~ is between 50 and 300 parts per million per degree Celsius.

7. (canceled).

8. (original) The optical waveguide according to claim 1, wherein the polymer substrate is from the group consisting of polycarbonate, acrylic, polymethyl methacrylate, cellulosic, thermoplastic elastomer, ethylene butyl acrylate, ethylene vinyl alcohol, ethylene tetrafluoroethylene, fluorinated ethylene propylene, polyetherimide, polyethersulfone, polyetheretherketone, polyperfluoroalkoxyethylene, nylon, polybenzimidazole, polyester, polyethylene, polynorbornene, polyimide, polystyrene, polysulfone, polyvinyl chloride, polyvinylidene fluoride, ABS polymers, polyacrylonitrile butadiene styrene, acetal copolymer, poly[2,2-bistrifluoromethyl-4,5-difluoro-1,3-dioxole-co-tetrafluoroethylene], poly[2,3-(perfluoroalkenyl) perfluorotetrahydrofuran], poly[2,2,4-trifluoro-5-trifluoromethoxy-1,3-dioxole-co-tetrafluoroethylene], and any other thermoplastic polymers; and thermoset polymers,

such as diallyl phthalate, epoxy, furan, phenolic, thermoset polyester, polyurethane, and vinyl ester.

9. (original) The optical waveguide according to claim 8, wherein the polymer substrate is a blend of at least two of the polymers from the group.

10. (original) The optical waveguide according to claim 1, wherein the lower cladding is from the group consisting of poly[2,3-(perfluoroalkenyl) perfluorotetrahydrofuran], poly[2,2,4-trifluoro-5-trifluoromethoxy-1,3-dioxole-co-tetrafluoroethylene], and poly[2,2-bistrifluoromethyl-4,5-difluoro-1,3-dioxole-co-tetrafluoroethylene].

11. (original) The optical waveguide according to claim 1, wherein the lower cladding is a blend of at least a first polymer and a second polymer.

12. (original) The optical waveguide according to claim 1, wherein the core transmits single-mode light.

13. (original) The optical waveguide according to claim 1, wherein the core contains a rare earth element.

14. (original) The optical waveguide according to claim 1, wherein the substrate has a roughened surface.

15. (original) The optical waveguide according to claim 14, wherein the roughened surface is approximately 50 to 100 nanometers deep.

16. (original) The optical waveguide according to claim 1, wherein the substrate has an oxygenated surface.

17. (original) The optical waveguide according to claim 1, wherein the optical waveguide is adapted to amplify light.

18. (amended) A method of manufacturing an optical waveguide comprising:

providing a polymer substrate having a first coefficient of thermal expansion;

depositing a first perhalogenated polymer onto the substrate, wherein the first perhalogenated polymer has a second coefficient of thermal expansion differing from the first coefficient of thermal expansion by less than approximately 40%;

depositing a first polymer onto the first perhalogenated polymer; and

depositing a second polymer onto the first polymer.

19. (original) The method according to claim 18, wherein depositing the second polymer comprises depositing the first perhalogenated polymer.

20. (original) The method according to claim 18, wherein depositing the first polymer

comprises depositing a rare earth containing perhalogenated polymer.

21. (original) The method according to claim 18, wherein depositing the first perhalogenated polymer onto the substrate comprises:

dissolving a first perhalogenated polymer in a solvent, forming a first solution;

spincoating the first solution onto the substrate; and

evaporating the solvent from the first solution.

22. (original) The method according to claim 18, further comprising, prior to depositing the first perhalogenated polymer onto the substrate, preparing the substrate.

23. (original) The method according to claim 22, further comprising, prior to preparing the substrate, cleaning the substrate.

24. (original) The method according to claim 22, wherein preparing the substrate comprises roughening the substrate.

25. (original) The method according to claim 22, wherein preparing the substrate comprises oxygenating the substrate.

26. (original) The method according to claim 22, wherein preparing the substrate comprises applying a fluorinated coupling agent to the substrate.